DOCUMENT RESUME

ED 157 349 EC 111 866

AUTHOR Malian, Ida M.
TITLE Technological Innovations for Vocational Training for the Severely Handicapped: An International Perspective.
PUB DATE Jun 78
NOTE 17p.; Paper presented at the World Congress on Future Special Education (First, Stirling, Scotland, June 25 - July 1, 1978)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Adults; *Modeling (Psychological); Performance Factors; Research Projects; *Severely Handicapped; *Training Techniques; *Video Tape Recordings; *Vocational Education

ABSTRACT

A vocational training project involving videotape segments was conducted with four severely handicapped adults. Results indicated that a reinforced video modeling procedure was able to rapidly train severely handicapped adults (with a trainer to client ratio of one to two) on a complex benchwork assembly task. A correlational analysis of the group that achieved criterion revealed predictability measures for success and failure rates. (SBH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

124 #8

AUG 2 5 1978

Sponsored by THE COUNCIL FOR EXCEPTIONAL CHILDREN
1920 Association Drive Reston, Virginia 22091 Telephone: (703) 620-3660
Aaron Armfield, Program Chairman
The University of Nebraska at Omaha

WORLD CONGRESS ON FUTURE SPECIAL EDUCATION

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED157349

Technological Innovations for Vocational Training For the Severely Handicapped: An International Perspective

Ida M. Malian, Ph.D.
Assistant Professor - Special Education
University of Nebraska at Omaha
Omaha, Nebraska, USA

Paper presented at The First World Congress on Future Special Education, Stirling, Scotland, June 28, 1978.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

C.E.C.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

EC111866

WORLD CONGRESS JUNE 25 thru JULY 1, 1978 University of Stirling Stirling, Scotland

Modeling Techniques and Videotape Innovation In Vocational Rehabilitation

Ida M. Malian
University of Nebraska at Omaha

Introduction

The prevalence in the human services statistics of increasingly greater numbers of mildly and moderately handicapped individuals being placed into the community have presented a rapidly changing profile of the handicapped individual in residential institutions. By the same token, the percentage of severely and profoundly handicapped residents has, in most institutions, risen substantially in recent years (Wolfensberger, 1972). This trend, nationally and more appropriately, internationally, then, coupled with a parallel trend toward admission of the younger severely handicapped individual and increased nursing home program involvement for the aging handicapped, unfolds a rather vivid depiction of future institutional populations. Specifically, one comprised totally of severely handicapped individuals.

In many respects, the status of vocational habilitation of the severely handicapped adolescent and adult is a mirror image of the condition of special education services to the severely handicapped in the mid-1960's, in the United States. In fact, most community based adult services for the severely handicapped are not "vocational" and neither are they "habilitating." As has been noted by Lynch (1976), community based programming for the severely handicapped adolescent and adult is already in a state of crisis and within three to five years, it will probably experience a complete collapse because of the lack of a conceptual model, trained staff, and adequate facilities.

Greenleigh (1975) suggests that one-third of the clients studied in sheltered workshops in the United States had attended Special Education classes sometime in their educational life space. Further, 16 percent had at least a seventh grade education and one-fourth had completed high school. By most standards, these clients would be considered to be quite high functioning, thus precluding the severely handicapped from the parameters of this service.

There are increasing attempts on the part of the public education to serve as effective preparation for, as well as provide transition to, employment for the severely handicapped. This has resulted in the development of cooperative programs between education, vocational rehabilitation, and other community agencies (Fraenkel, 1961). One of the major criticisms of vocational programs for the severely handicapped has been the tendency to overemphasize and elaborately train individual clients for specific occupational placements. Underlying this approach is the traditional but mistaken notion that the "retarded" is devoid of skills and aptitudes and must be overtrained in unique competencies to meet the requisites of a particular job - usually a low one at that. However, the research literature, as well as employment statistics have sufficiently demonstrated not only the successful training and acquisition of complex vocational and social skills, but also subsequent sheltered workshop, community (typically industry) vocational placement.

An examination of everyday kinds of learning by adults and children suggest that much learning results in one person observing another. This kind of on-going learning is particularly appropriate

for teaching and learning highly complicated responses and behaviors for which shaping successive approximation to a terminal behavior would be an extended process.

The research literature is replete with experiments and their subsequent replications utilizing modeling and imitative procedures to train a variety of skills in a diverse handicapped population. Modeling techniques have just recently taken on the form of training with the mentally handicapped in facilitating the acquisition of community-oriented skills. It is this coupling of modeling techniques with vocational training that has been missing in the research literature.

It has been conclusively demonstrated over the past 20 years that mentally impaired individuals can be taught complex benchwork and service skills when systematic training procedures are employed. The work of Loos and Tizard (1955), Clarke and Heremelin (1955), Crosson (1960, 1969), Williams (1967), Gold's research on acquisition, transfer and retention (1972), on color coding (1974), and Hunter and Bellamy (1976) research on training severely and profoundly retarded adults to assemble 26 of 52 piece items, stand as sufficient evidence that the mentally impaired can work and achieve success at tasks that, in the experimental situation, are of a level of complexity far in excess of the typical contractual work found in most of the country's sheltered workshops. Yet, in spite of the sheer number and diversity of such successful demonstrations of the efficacy of modeling interventions, their systematic use and evaluation in training, pre-vocational contexts has been minimal not only in the United States but throughout the world.

Project Training Procedures

This project involved a videotape training group where subjects were trained at a 2:1 subject-trainer ratio, for three hours per day. The work sample utilized was the Bendix RX-70 Bicycle Brake. In the training situation, four subjects were instructed by one of two trainers to "Watch the television." The subjects then observed a segmented videotape of a model assembling the bicycle brake.

The camera focused closely on the model's hands and the assembly board making the features of each brake part highly evident, and accentuating the pieces' relevant dimensions through enlargement of the 26-inch screen. The model provided simple verbal cues during the videotape procedure. These verbal cues included "The nut goes down," and "The bearings go up." The correction procedure included the model inverting an assembly piece and verbalizing, "Try another way." This was consistent throughout the videotape segments. Upon successful completion by the model, a second person would socially reinforce him by saying, "Good, you've put together all the pieces." The model would then instruct the subjects to "Put the first six pieces together." The subjects' training board was identical to that of the videotape models'.

The subjects rehearsed the modeled assembly with the trainer priming, if necessary, chaining, and saying "good" after the subject successfully completed each module. Further, the trainers provided subjects' requests for assembly information consistent with the verbal cues already provided. When all subjects had rehearsed the sub-assembly once, the trainer redirected their attention to the videotape

monitor and the next module was shown. The procedure remained the same through the first three modules. After observing the fourth module the subjects were told to "See if you can put the bicycle brake together just like the man on television." Criterion for the brake assembly was set at six of eight assemblies, so that if subjects did not successfully assemble six of eight brakes in the designated period of days they were classified as "Did not finish." Additionally, subjects who did not show a reduction in high error rate (12 trials with no reduction in errors) were terminated and classified as "Did not finish." Coders were recording number of errors, total time elapsed to criterion, behavior during training, and other supplemental comments.

Results

This project found that a reinforced video modeling procedure was able to rapidly train a selected portion of a population of severely handicapped adults with a trainer to client ratio of 1:2 to criterion on a complex benchwork assembly.

Subjects who achieved criterion on the complex assembly task evidenced higher intelligence scores (mean of 38.5 versus 19.1); higher Neuromuscular Development Index (90.52 versus 57.7); higher MAND-Total scores (470.4 versus 292.9); and more years of institutionalization (110 months versus 93 months). Additionally, the group that achieved criterion demonstrated lower total time (169.1 minutes versus 292.9); total errors to criterion (75.9 versus 216.92); days in training (1.4 versus 1.9); and chronological age (25.7 versus 30.0). (Table 1)

Predictor Variables

Correlational analyses of the group that achieved criterion revealed that intelligence scores were negatively related to total time (-.54), indicating the higher the intelligence of the subjects the less time that elapsed to criterion on the assembly task. Also, intelligence and MAND-NDI and MAND-total scores were positively related (.69 and .71 respectively). One interpretation of this relationship is that the higher the intelligence the higher the Neuromuscular Development Indices. (Table 2)

Both the MAND-Neuromuscular Development Index and MAND-total scores correlated significantly (.98) suggesting that both scores are measuring the same variable. Consistent with the intelligence relationships, the MAND-NDI and total were highly negatively correlated (-.72 and -.69) with total time elapsed to criterion. This again reveals that the higher the MAND scores the less time that elapsed to the criterion measure. Additionally, a negative relationship (-.66) was found for both MAND scores and days in training, so that the higher the MAND scores, the less days that were involved in training.

Total time elapsed and total errors performed to criterion were found to be significantly related (.65), indicating that the more time that had elapsed yielded more errors. This also ties into the significant relationship between total time and days in training (.89). These results demonstrated that the more time elapsed to criterion also yielded more days in training. One possible interpretation of this relationship is that those committing a greater amount of errors needed a greater amount of time and, hense, more total days.

Further, total errors performed to criterion were found to be correlated (.59) with days in training, so that the greater the number of errors the more days were required to achieve criterion.

With respect to the modeling group that did not achieve criterion, the correlational analysis presented a parallel result to the group that achieved criterion. (Table 3). The points of departure came with intelligence not being significantly related to MAND-NDI (.18) or MAND-total scores (.15). This suggests that MAND scores, for the group that failed to achieve criterion, and intelligence scores are tapping into different factors. This may also indicate that the two groups were indeed truly different and perhaps institutionalization and being labeled "severely handicapped" were not appropriate selection criteria.

Further comparative analyses reveal that for all variables except years of institutionalization, days in training and chronological age, the data strongly suggest that intelligence, MAND-Neuromuscular Development Index, and MAND-total score were significant variables accounting for the modeling group differences.

Contributions of this Project

First, this project presented a modeling procedure as a viable alternative to vocational training that facilitates the acquisition of a complex assembly task, the Bendix RX-70 Bicycle Brake.

Second, the utilization of a videotape model as a training technique in the vocational habilitation of severely handicapped individuals had not been explored in any depth prior to this investigation. As a result, this videotape modeling procedure presented

the potential to be economical, effective, efficient and reliable for vocational training for severely handicapped individuals. The videotape technique can be developed universally and transcends language barriers.

Third, this project included the development of predictability measures for success and failure rates for complex skill acquisition from routine pretraining information in time limited training. The extrapolation of these measures yielded a complex skill acquisition profile which can serve as a screening tool for vocational rehabilitators. This screening tool is not, to be sure, one of excluding clients from training, but rather to screen for training method. Consequently, if a sub-contract is obtained at a facility, the profile may be utilized to isolate those clients who would most reliably acquire assembly behaviors rapidly. To further illustrate, if a contract involved the Bendix RX-70 Bicycle Brake, as did this study, the profile (Figure 1) would suggest the selection of a client with a Neuromuscular Development Index between 50 and 100 and an intelligence score greater than 50. Ultimately, the profile serves as a quick reference for matching clients to time-limited training tasks. These profiles can be developed geographically, by client, institution and task specifics.

Fourth, conceding budget, personnel and time constraints on the part of vocational training facilities, this project suggested a functional training procedure that was economical of trainer time and facility resources. Ultimately pre-vocational/vocational skills training can be operationalized in the community, as well as individual

skill acquisition and the right to the least restrictive environment. It is then that such extrapolations from this project will encourage and support the design and delivery of habilitation programs based upon the principles of social and physical integration to meet individual needs, and whose components include community-oriented developmental models.

However, these results do not, by any means, suggest or imply that individuals with low MAND-NDI, MAND-total, or WAIS scores be considered low "non-feasible" or denied habilitation or vocational education services. This study suggests, in essence, that certain training procedures, such as modeling, are perhaps more efficient than non-modeling procedures for certain clients. Also, in a time-limited training program indices of neuromuscular development and intellectual factors can reasonably predict the likelihood of task acquisition. And that intelligence, as measured by the WAIS and neuromuscular development, as measured by the MAND-NDI, can account for group differences between those who achieve and fail to achieve criterion. Additionally, subject selection variables such as years of institutionalization and chronological age were not demonstrated to be predictive of success or failure. In terms of model-observer interaction then, it appears that the videotape model may have functioned more as an appropriate training model for the group that achieved criterion than for the group that failed to achieve criterion.

It is the hopes that the practical results of this project can be conveyed and operationalized by professionals in the field of international rehabilitation - to facilitate the actualization of normalization and the severely handicapped individual's right to the least restrictive environment, throughout the world.

TABLE 1

Means, Ranges, and Standard Deviations of Descriptive Variables For the Video Tape Modeling Group

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD. DEV.
IQ	55	0	82.000	29.127	18.792
MANDI	55	3.0000	139.00	68.909	34.982
MANTOT	55	5.0000	726.00	347.31	204.76
YRINST (Months)	55	1.0000	334.00	95.273	66.410
TOTTIM	55	0	555.00	155.60	142.37
TOTERR	55	0	476.00	94.945	114.19
DAYSTRN	55	1.0000	4.0000	1.4182	.71209
AGEYRS	55	15.083	58.500	29.017	9.2568

TABLE 2

Means, Ranges and Standard Deviations of Descriptive Variables For the Group That Achieved Criterion

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD. DEV.
IQ	29	0	82.00	38.55	19.13
MANDI	29	55.00	139.00	90.52	23.69
MANTOT	29	198.00	726.00	470.38	136.37
YRINST (Months)	29	1.00	334.00	101.03	76.01
TOTTIM	29	50.00	420.00	169.17	120.36
TOTERR	29	7.00	476.00	75.83	101.96
DAYSTRN	29	1.00	3.00	1.38	.56
AGEYRS	29	15.08	49.08	25.74	8.30

TABLE 3

Means, Ranges, and Standard Deviations of Descriptive Variables For the Group That Failed to Achieve Criterion

VARIABLE	N	MINIMUM	MAXIMUM	MEAN	STD. DEV.
IQ	13	0	40.00	19.15	11.39
MANDI	13	24.00	117.00	57.69	30.72
MANTOT	13	79.00	640.00	292.85	187.85
YRINST (Months)	13	29.00	151.00	93.69	53.39
TOTTIM	13	120.00	555.00	260.00	140.77
TOTERR	13	53.00	337.00	216.92	86.19
DAYSTRN	13	1.00	4.00	1.85	1.07
AGEURS	13	17.50	43.75	30.06	6.78

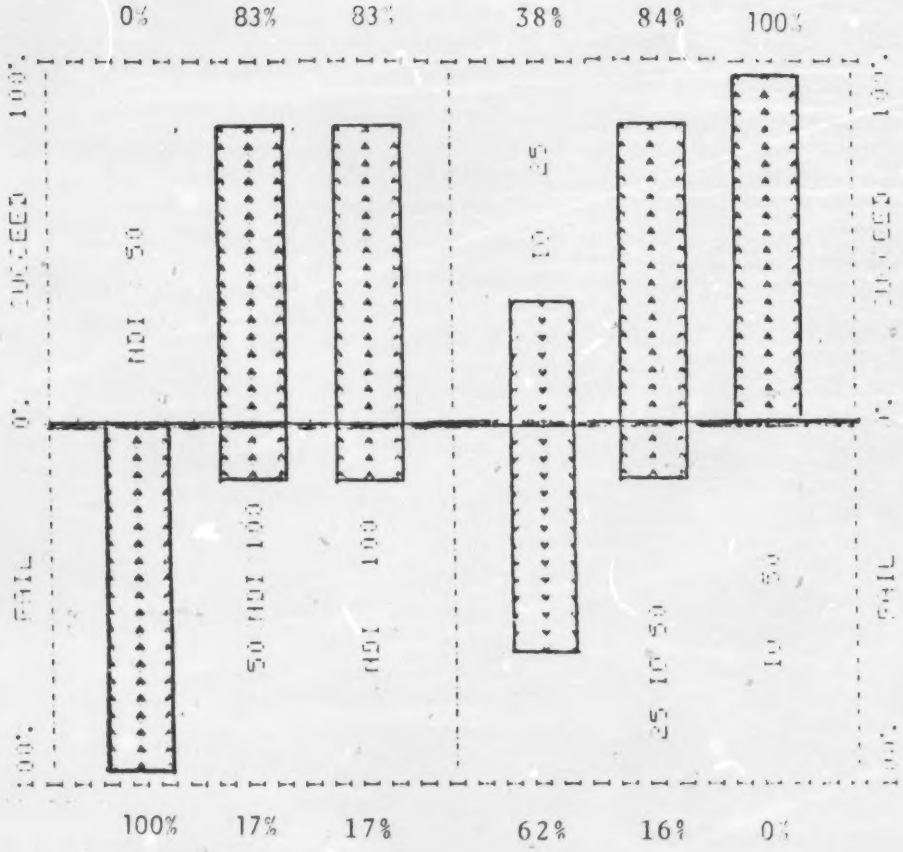

Figure 1. Bar graph depicting success and failure rates of modeling training procedures relative to intelligence and neuromuscular development scores.

REFERENCES

Clarke, A., Heremelin, F. Adult Embecils: Their Abilities and Trainability. The Lancet, 1955, 2:337-339.

Crosson, J.E. A Technique for Programming Sheltered Workshop Environments for Training Severely Retarded Workers. American Journal of Mental Deficiency, 1969, Vol. 72, 814-818.

Crosson, J.E. The Functional Analysis of Behavior: A Technology for Special Education Practice. Mental Retardation, 1960, Vol. 7(4), 15-19.

Fraenkel, W.A. The Mentally Retarded and Their Vocational Rehabilitation: A Resource Handbook. New York: National Association for Retarded Citizens, 1961.

Gold, M.W. Redundent Cue Removal and Skill Training for the Retarded. Education and Training of the Mentally Retarded, 1974, Vol. 9(1), 5-8.

Gold, M.W. Stimulus Factors in Skill Training of the Retarded on a Complex Assembly Task: Acquisition Transfer and Retention. American Journal of Mental Deficiency, 1972, Vol. 76, 417-426.

Greenleigh, A. The Role of the Sheltered Workshops in the Rehabilitation of Severely Handicapped, Volume I. Executive Summary, Greenleigh Associates, Inc., New York, 1975.

Hunter, J. and Bellamy, T. Cable Harness Construction for Severely Retarded Adults: A Demonstration of Training Technique. In Bellamy (Ed.), Habilitation of the Severely and Profoundly Retarded Reports from the Specialized Training Program. Eugene, Oregon: University of Oregon Center on Human Development, 1976.

Loos, F.M. and Tizard, J. The Employment of Adult Embecils in a Hospital Workshop. American Journal of Mental Deficiency, 1955, Vol. 59, 395-403.

Lynch, K. Creative Sheltered Employment of the Severely Handicapped: A Conceptual Model. Paper presented at The American Association on Mental Deficiency Annual Convention, Chicago, Illinois, June, 1976.

Lynch, K.P. and Malian, I.M. Comparative Effectiveness of a Live Versus Videotape Reinforced Modeling Procedure in Teaching a Complex Assembly Task to Severely Handicapped Adults. Paper presented to The International Association for the Scientific Study of Mental Deficiency, Washington, D.C.: August, 1976.

Williams, P. Industrial Training and Renumerative Employment of the Profoundly Retarded. Journal of Mental Subnormality, 1967, Vol. 13, 14-23.

Wolfensberger, W. The Principles of Normalization in Human Services. National Institute on Mental Retardation, Toronto, Canada, 1972.